B.Sc. Semester-IV Examination, 2022-23

ELECTRONICS [Honours]

Course ID : 41713 Course Code : SH/ELC/403/C-10(T-10)

Course Title : Electronic Instrumentation

Time : 1 Hour 15 Minutes Full Marks : 25

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

1. Answer any **three** from the following questions: 1×3=3

   a) Why PMMC type galvanometers are better then PCMM?

   b) How a Galvanometer is converted into an ammeter?

   c) What is the function of a time base circuit in a CRO?

   d) Why a P.O box is not suitable for the measurement of both very low and very high resistances?

   e) Why Maxwell's impedance bridge is not suitable for the measurement of very high value of self Inductance?

   f) Draw the circuit diagram of generalized AC Wheatstone bridge.

2. Answer any **three** from the following questions: 2×3=6

   a) What are the balance conditions of a generalized AC Wheatstone bridge?

   b) Define the sensitivity of voltmeter/ multimeter.

   c) What is thermo e.m.f? How is it generated?

   d) How a CRO is used for measuring unknown frequency(f)?

   e) What is the basic difference between Maxwell's bridge and Anderson's bridge?

   f) Name one Audio Frequency Oscillator. How Barkhausen criterion for the condition of oscillation are satisfied here?

3. Answer any **two** from the following questions: 5×2=10

   a) Draw the circuit diagram of a Kelvin double bridge with proper limitation, which is used for measurement of very low resistance. Derive the expression for the balance condition of the bridge. 2+3=5

b) Obtain the expression for electrostatic deflection sensitivity in a cathode ray tube(CRT). 5

c) Draw the circuit diagram of a Maxwell's bridge. Derive an expression for the unknown inductance(L) at the balanced condition of the bridge. 1+4=5

d) Draw the circuit diagram of a DC multi range voltmeter by using PMMC type galvanometer and explain its operation. 5

4. Answer any **one** from the following questions: 6×1=6

a) Draw the circuit diagram of AC voltmeter in single range by using PMMC type galvanometer. 6

b) Describe the method briefly by which high value of resistances are measured accurately with the help of a proper circuit diagram. 6

c) What is Schering Bridge? Describe qualitatively how any unknown value of a capacitor can be measured with this Schering Bridge. 1+5=6

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